

- Genus *Lisgocaris*, Clarke, 1882. One species.
Aptychopsis, Barrande, 1872. One species.
Dictyocaris, Salter, 1860. Two species.
Dithyrocaris, Scouler (*Argas*), 1835. Five species.
Rachura, Scudder, 1878. One species.

This list would be much augmented on revision up to present date. Several of M. Barrande's Bohemian forms, such as *Aristozoe* and its allies, evidently will have to be grouped with Mr. Whitfield's *Echinocaris*.

Part VIII. (pp. 453-458) is a long and useful bibliography, but not quite perfect as to fossil Phyllopodæ. An Appendix follows with—C. Th. von Siebold, On the parthenogenesis and artificial rearing of the Brine-shrimp (p. 463); C. F. Gissler, On parthenogenesis in *Artemia* (p. 466); and W. J. Schmankewitsch, On the transformation of *Artemia salina* to *A. Muehlhausenii* and to *Branchipis* (p. 466).

Thirty-seven carefully drawn lithographic plates and numerous good woodcuts, illustrating this valuable Monograph, show the details of the external and internal structure of the numerous genera and species described.

A Monograph of the Insectivora, Systematic and Anatomical. By G. E. Dobson, M.A., F.R.S. Part i. 1882. Part ii. 1883. London. 4to.

DR. DOBSON is laying up for himself a store of heavy gratitude from all well-minded zoologists; but, however excellent their dispositions, there are some who will envy him. The author of the admirable 'Catalogue of the Chiroptera in the Collection of the British Museum' is now, with the assistance of the Government-Grant Committee of the Royal Society, writing a monograph on the very group of mammals that above all deserve it; for it is among the Insectivora that we find the most generalized forms of the group, and suggestions as to higher structural characters which are nowhere repeated.

He will not be envied for having undertaken a difficult task, but for the wisdom with which he devotes his leisure and his opportunities to the production of a monograph worthy of the name. From one circumstance or another most students of zoology find themselves the writers of scattered though in some cases very valuable essays. But these are, with rare exceptions, not the works that have a permanent value for science; it is only when they are focussed that their proper proportions are seen.

If we take a survey of the past we find this amply illustrated by the works of Cuvier, of Meckel, and of Owen in the great department of anatomical inquiry, in the impetus given to systematic zoology by the publications of the British Museum and of the Museum of Comparative Zoology at Cambridge, U. S. A., and in the promising field of geographical distribution by the great work of Wallace. These are examples of comprehensive works which, with others that will be easily recalled, have had as much influence for

good as have the patient investigations of various naturalists into the structure and life-history of a given type.

Those who write works like these are, whether they think of it or not, raising for themselves monuments of intelligent and well-directed industry which will last long after the contents of many Transactions and Journals have been digested, and have become themselves neglected.

So much is said against and so little is said for the opportunities which are given to zoologists in this country, that we cannot refrain from pointing out that Mr. Dobson returns his especial thanks to Sir W. Muir, who, at the time of the writing of his preface, was the enlightened head of the Army Medical Department.

The two parts of the Monograph now before us deal with six families:—the Erinaceidæ, Centetidæ, and Solenodontidæ; the Potamogalidæ, Chrysochloridæ, and Talpidæ. In addition to a detailed anatomical examination of a number of typical forms, all the species are dealt with in the fashion of a systematic zoologist; twenty-two plates, with a number of woodcuts, illustrate the text, and speak for the care that has been given to the supervision of their production.

One would require more than the usual calm superiority of a reviewer to closely criticise the work in these two parts; we propose rather to direct the attention of the reader to one or two points which seem to have been treated in a novel manner.

No one has ever studied the Mammalia without being attracted to their dentition; yet few seem to have studied it with profit; and even those who have made important discoveries are still in doubt as to some considerable questions of homology. We are glad to see that Dr. Dobson recognizes the value of formulæ in the manipulation of such questions; and, indeed, he does not recognize it merely, he demonstrates it. In four lines he shows us by an ingenious method his views as to the homologies of the teeth in *Gymnura* with the typical dentition of a diphyodont heterodont mammal, and those of the hedgehog:—

GYMNURA.

$$i. \frac{6=(2a+2b+2c)}{6=(2a'+2b'+2c')}, c. \frac{2=(d+d)}{2=(d'+d')}, pm. \frac{8=(2e+2f+2g+2h)}{8=(2e'+2f'+2g'+2h')}, m. \frac{6=(2i+2j+2k)}{6=(2i'+2j'+2k')}.$$

ERINACEUS.

$$i. \frac{6=(2a+2b+2c)}{4=(2a'+2b')}, c. \frac{2=(d+d)}{2=(d'+d')}, pm. \frac{6=(2f+2g+2h)}{4=(2f'+2h')}, m. \frac{6=(2i+2j+2k)}{6=(2i'+2j'+2k')}.$$

If we are to retain the term “ canine ” at all, we shall perhaps do well to follow Dr. Dobson and keep to the old definition that the “ canine ” in the lower jaw is the tooth that comes in front of the upper canine when the jaws are closed; on the other hand we have to remember that the connotation of canine is almost as much physiological as homological, and in the mole the “ caniniform ” tooth shuts behind, and not in front of, the upper canine. Mr. Dobson is, at any rate, bolder than Mr. C. S. Tomes, who some years ago refused to write out the dental formula of the mole.

The writers of zoological text-books must bear in mind *Microgale*

longicaudata; for now is there known to science a mammal with more caudal vertebræ than the familiar *Manis*.

The object of this notice has not been to review, so much as to give a note on, Mr. Dobson's work, and, if it may be, to increase the interest which is felt in its publication. To the author himself we have only to say that, as this work will before long be completed, we trust he is beginning to accumulate material for a monograph on some other order of that great group of animals in which, after all, men must always have the most lively interest.

MISCELLANEOUS.

Observations on Actinosphærium Eichhornii.

By Miss S. G. FOULKE.

It was stated that, while observing *Actinosphæria*, four individuals were seen to become fused, as it were, into one mass.

At the end of an hour this mass had separated into three *Actinosphæria*, two of the original four remaining fused into one.

This double one then became constricted, a little to one side of the middle, apparently being about to separate. In a few minutes the *Actinosphærium* began to eject, at the point of constriction, a thin protoplasmic substance containing transparent granulated globules and free granules. By a waving motion of the rays, the masses of ejected matter were broken up and the globules set free in the water.

These globules developed from one side an extremely long ray of finely granular protoplasm, slightly elongating at the same time, thus taking an oval shape. No trace of the axial threads peculiar to the rays of adult *Actinosphæria* could be discovered. The average length of these globules, including the ray, was $\cdot 1422$ millim., without the ray $\cdot 0127$ millim.

The next act of the globules was the sending out another ray from a point opposite to the first. Minute vacuoles appeared and ranged themselves close to the surface of the globule. Other rays were developed at various intervals of time. The appearance of the young *Actinosphæria* gradually became more perfect in resemblance to the parent. The growth was very slow, the perfect form not being attained for a period varying from one to two weeks, and the size was even then small.

The external layer of vacuoles of the *Actinosphærium* from which the globules had been ejected contained numbers of granules in active motion. In the different vacuoles the number varied from ten to about one hundred, as nearly as could be counted. They were usually congregated at one point, and seemed to be trying to force a way out.

Sometimes a globular mass of protoplasm was seen to run out upon a ray, and then, instead of returning to the body as usual, drop off into the water, and develop into a perfect *Actinosphærium*, in the same manner as those ejected in a mass from the body.